(b) said plurality of conductive members arranged to form a first opening having a first diameter and a second opening having a second diameter different from said first diameter; and

(c) said tapered portions of said conductive members providing said coil with a substantially homogeneous pattern of magnetic flux density in at least one of three orthogonal imaging planes of said coil.

47. (New) The coil claimed in claim 46 wherein said coil is a birdcage coil.

48. (New) The coil claimed in claim 46 wherein said second diameter of said second opening is smaller than said first diameter of said first opening.

49. (New) The coil claimed in claim 46 wherein said tapered portion of each of said conductive members comprises at least one angled linear segmented section.

50. (New) The coil claimed in claim 46 wherein said tapered portion of each of said conductive members has a radius that is selected to maximize homogeneity of said magnetic flux density in at least one of an XZ plane and a YZ plane of said orthogonal imaging planes of said coil.

51. (New) The coil claimed in claim 46 wherein said first opening is formed by a first conductive ring and said second opening is formed by a second conductive ring, with said linear and said tapered portion of each of said conductive members being serially connected and thus electrically interconnecting said first and said second conductive rings.

52. (New) The coil claimed in claim 46 wherein said first opening is adapted for accommodating insertion of a head of a patient into said coil.

53. (New) The coil claimed in claim 46 wherein said conductive members of said coil are supported by a housing therefor.

54. (New) The coil claimed in claim 46 wherein said first and said second openings are circular.

55. (New) The coil claimed in claim 46 wherein said first and said second openings are elliptical with said first diameter being a major diameter of said first opening and said second diameter being a major diameter of said second opening.

56. (New) The coil claimed in claim 46 wherein said coil is a receive-only coil.

57. (New) The coil claimed in claim 46 wherein said coil is a transmit/receive coil.

58. (New) The coil claimed in claim 46 wherein said conductive members contain therein a plurality of reactive electrical components.

59. (New) The coil claimed in claim 46 wherein said coil is configured as one of a low pass coil, a high pass coil and a band pass coil.

60. (New) The coil claimed in claim 46 wherein said coil is operable in one of a linear mode and a quadrature mode.

61. (New) A coil array for use with a magnetic resonance (MR) system, said coil array comprising:

(a) a first coil having a plurality of conductive members such that:

(i) each of said conductive members has a linear portion and a tapered portion;

(ii) said plurality of conductive members are arranged to form a first opening having a first diameter and a second opening having a second diameter, with said second diameter being different from said first diameter; and

(iii) said tapered portions of said conductive members providing said first coil with a substantially homogeneous pattern of magnetic flux density in at least one of three orthogonal imaging planes of said first coil; and

(b) at least one additional coil at least partially overlapping said first coil at an inferior end thereof to form therewith, and for operation as, said coil array.

62. (New) A coil for use with a magnetic resonance (MR) system, said coil comprising:

(a) a first end having a first diameter;

(b) a second end having a second diameter different from said first diameter; and

(c) a plurality of conductive rods extending between said first and said second ends, each of said conductive rods having a linear portion and a tapered portion with said linear portion being connected to said first end and said tapered portion being connected to said second end, said tapered portions of said conductive rods providing said coil with a substantially homogeneous pattern of magnetic flux density in at least one of three orthogonal imaging planes of said coil.

63. (New) The coil claimed in claim 62 wherein said coil is a birdcage coil.

64. (New) The coil claimed in claim 62 wherein said second diameter of said second end is smaller than said first diameter of said first end.

65. (New) The coil claimed in claim 62 wherein said tapered portion of each of said conductive rods comprises at least one angled linear segmented section.

66. (New) The coil claimed in claim 62 wherein said tapered portion of each of said conductive rods has a radius that is selected to maximize homogeneity of said magnetic flux density in at least one of an XZ plane and a YZ plane of said orthogonal imaging planes of said coil.

67. (New) The coil claimed in claim 62 wherein said first end includes a first conductive ring and said second end includes a second conductive ring, with said conductive rods electrically interconnecting said first and said second conductive rings.

68. (New) The coil claimed in claim 67 wherein said first conductive ring and said second conductive ring are each larger in diameter than a center of said coil to thereby enable a concentration of said magnetic flux density to be produced at a region centered within said coil.

69. (New) The coil claimed in claim 62 further comprising at least one additional coil at least partially overlapping said coil at an inferior end thereof to form therewith, and for operation as, a phased array.

70. (New) The coil claimed in claim 62 wherein said first and said second ends are circular.

71. (New) The coil claimed in claim 62 wherein said first and said second ends are elliptical with said first diameter being a major diameter of said first end and said second diameter being a major diameter of said second end.

72. (New) The coil claimed in claim 62 wherein said coil is a receive-only coil.

73. (New) The coil claimed in claim 62 wherein said coil is a transmit/receive coil.

74. (New) The coil claimed in claim 67 wherein each of said conductive rods and said first and said second conductive rings contain therein a plurality of reactive electrical components.

75. (New) The coil claimed in claim 62 wherein said coil is configured as one of a low pass coil, a high pass coil and a band pass coil.

76. (New) The coil claimed in claim 62 wherein said coil is operable in one of a linear mode and a quadrature mode.

77. (New) A coil for use with a magnetic resonance (MR) system, said coil comprising:

(a) a first end having a first diameter;

(b) a second end having a second diameter; and

(c) a plurality of conductive rods extending between said first and said second ends, each of said conductive rods at each end thereof having a tapered portion, said tapered portions being selected to maximize homogeneity of magnetic flux density in said coil.

78. (New) The coil claimed in claim 77 wherein said first and said second diameters of said first and said second ends, respectively, are equal.

79. (New) The coil claimed in claim 77 wherein said first and said second diameters are each larger than a diameter at a center of said coil such that said tapered portions of said conductive rods are tapered outwardly.

80. (New) The coil claimed in claim 77 wherein said first and said second diameters are each smaller than a diameter at a center of said coil such that said tapered portions of said conductive rods are tapered inwardly.

81. (New) The coil claimed in claim 77 wherein said coil is a birdcage coil.

82. A method of designing a coil capable of exhibiting a substantially homogeneous pattern of magnetic flux density while at least one of avoiding substantial degradation of, maintaining and improving signal-to-noise ratio performance, said method comprising the steps of:

(a) providing a model of a conventional resonator, said conventional resonator having a first end and a second end between which extend a plurality of conductive rods;

(b) ascertaining said magnetic flux density within said resonator; and

(c) adjusting a geometry of at least one of said first end, said second end, and said conductive rods to improve the homogeneity of said magnetic flux density and thereby form said coil.

83. (New) The method as claimed in claim 82 wherein said coil is a birdcage coil.

84. (New) The method as claimed in claim 82 wherein said first end includes a first conductive ring and said second end includes a second conductive ring, with said conductive rods electrically interconnecting said first and said second conductive rings.

85. (New) The method as claimed in claim 82 wherein the step of providing a model of a conventional resonator comprises using a wire model thereof.

86. (New) The method as claimed in claim 82 wherein the step of ascertaining said magnetic flux density involves at least one of Biot-Savart modeling and experimental verification.

87. (New) The method as claimed in claim 82 wherein the step of adjusting involves changing at least one of (i) a diameter of said first end, (ii) a diameter of said second end and (iii) a radius of a taper of said conductive rods at least at one end thereof.

88. (New) The method as claimed in claim 82 wherein the step of adjusting optionally applies to a length of said conductive rods when said signal-to-noise ratio performance of said coil is less important.

89. (New) The method as claimed in claim 82 wherein the step of adjusting is performed iteratively.

90. (New) The method as claimed in claim 82 further comprising the step of adjusting a volume of said coil to improve said signal-to-noise ratio performance thereof.

91. (New) A birdcage coil for use with a magnetic resonance (MR) system for at least one of obtaining images of a region of interest and ascertaining the spectra of said region of interest during an MR scanning procedure, said birdcage coil comprising:

(a) an inferior end having a first diameter through which said region of interest is provided access to said birdcage coil;

(b) a superior end having a second diameter smaller than said first diameter of said inferior end; and

(c) a plurality of conductive rods extending between said inferior and said superior ends, each of said conductive rods having a linear portion and a tapered portion with said linear portion being connected to said inferior end and said tapered portion being connected to said superior end, said tapered portions of said conductive rods providing said coil with a substantially homogeneous pattern of magnetic flux density in at least one of three imaging planes of said birdcage coil while at least one of maintaining and improving a signal-to-noise ratio of said birdcage coil.